A.D. 1875, 13th December. N° 4320.

SPECIFICATION

OF

ROBERT MILBURN & HENRY JACKSON.

DECOMPOSING NOXIOUS VAPOURS.

LONDON:
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A.D. 1875, 13th December. N° 4320.

Decomposing Noxious Vapours.

LETTERS PATENT to Robert Milburn, of the Hatcham Iron Works, Pomeroy Street, New Cross Road, in the County of Surrey, and Henry Jackson, of 16, Park Square, Leeds, in the County of York, for the Invention of "Improvements in the Method of and in Means for Decomposing or Rendering less Noxious the Vapours resulting from Processes of Drying Sewage Deposit, Excrement, Blood, and other Matters."

Sealed the 9th June 1876, and dated the 13th December 1875.

PROVISIONAL SPECIFICATION left by the said Robert Milburn and Henry Jackson at the Office of the Commissioners of Patents, with their Petition, on the 13th December 1875.

We, Robert Milburn, of the Hatcham Iron Works, Pomeroy Street,
5 New Cross Road, in the County of Surrey, and Henry Jackson, of 16, Park Square, Leeds, in the County of York, do hereby declare the nature of the said Invention for "Improvements in the Method of and in Means for Decomposing or Rendering less Noxious the Vapours resulting

FROM PROCESSES OF DRYING SEWAGE DEPOSIT, EXCREMENT, BLOOD, AND OTHER MATTERS," to be as follows:—

Our Invention relates to processes for drying or for lessening the amount of contained moisture in night soil, sewage deposit, animal evacuations, blood, and other matters, in order to convert them into manure, as is well understood. We enclose or cover over, or partially enclose or cover over, the drying floors or kilns, and we withdraw the vapours from the enclosed or partially enclosed spaces by means of fans, blowers, steam jets, or exhausting apparatus, and we force the said vapours through two or more fires consecutively. We prefer to use a set of four furnaces, arranged in two pairs, and provided with close fitting fire and ash-pit doors. The vapours are conducted into the ash-pit of the first furnace in each pair, and after passing through the fire are led into the ash-pit of the second furnace, and after passing through the fire are discharged into the atmosphere or conveyed into a chimney. Flues and passages provided with doors or dampers are so arranged as that the current of vapours can be divided and be conveyed into the ash-pits of the two first fires, and also that when required the whole of the vapours can be conveyed into either one of the said two ash-pits. When it is necessary to open the fire or ash-pit doors of a furnace in one of the pairs of furnaces, the dampers are arranged to direct the whole of the vapours through the other pair. We have found it to be of importance to pass the vapours through more than one fire, as one fire only has not sufficient effect.

In order to maintain the fires at a regular heat we prefer to use the self-acting furnace described in the Specification of Letters Patent previously granted to us, and dated the Third of March One thousand eight hundred and seventy-four, and numbered 1006.

In some cases we prefer to use or burn a small quantity of sulphur with the fires.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Robert Milburn and Henry Jackson in the Great Seal Patent Office on the 12th June 1876.

TO ALL TO WHOM THESE PRESENTS SHALL COME, we, ROBERT MILBURN, of the Hatcham Iron Works, Pomeroy Street, New Cross Road, in the County of Surrey, and HENRY JACKSON, of 16, Park Square, Leeds, in the County of York, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Thirteenth day of December, in the year of our Lord One thousand eight hundred and seventy-five, in the thirty-ninth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto us, the said Robert Milburn and Henry Jackson, Her special license that we, the said Robert Milburn and Henry Jackson, our executors, administrators, and assigns, or such others as we, the said Robert Milburn and Henry Jackson, our executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN THE METHOD OF AND IN MEANS FOR DECOMPOSING OR RENDERING LESS NOXIOUS THE VAPOURS RESULTING FROM PROCESSES OF DRYING SEWAGE DEPOSIT, EXCREMENT, BLOOD, AND OTHER MATTERS," upon the condition (amongst others) that we, the said Robert Milburn and Henry Jackson, our executors, administrators, and assigns, by an instrument in writing under our, or one of our, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same is to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that we, the said Robert Milburn and Henry Jackson, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described

and ascertained in and by the following statement (and accompanying Drawings), that is to say:—

Our Invention relates to processes for drying or for lessening the amount of contained moisture in night soils, sewage deposit, animal evacuations, blood, and other matters, in order to convert them into manure, as is well understood. We enclose or cover over, or partially enclose or cover over, the drying floors or kilns, and we withdraw the vapours from the enclosed or partially enclosed spaces by means of fans, blowers, steam jets, or exhausting apparatus, and we force the said vapours through two or more fires consecutively. When two fires are used the vapours are conducted into the ash-pit of the first furnace, and after passing through the fire are led into the ash-pit of the second furnace, and after passing through the fire are discharged into the atmosphere or conveyed into a chimney.

In order to maintain the fires at a regular heat we prefer to use the self-acting furnace described in the Specification of Letters Patent previously granted to us, and dated the Third of March One thousand eight hundred and seventy-four, and numbered 1006.

In some cases we prefer to use or burn a small quantity of sulphur with the fires.

And in order that our said Invention may be fully understood, we have appended hereunto a Sheet of Drawings made to a scale of about half an inch to the foot and marked with letters of reference, corresponding letters indicating the same parts in the various Figures.

The said Drawings illustrate the application of our Invention to the apparatus for drying sewage and other matters, for which have been granted to us Letters Patent, bearing date the Thirtieth day of July, in the year One thousand eight hundred and seventy-two.

Referring in this place to the said Drawings, Fig. 1, represents a side elevation; Fig. 2, a plan; and Fig. 3, an end elevation of the furnace end of our drying apparatus as rendered more efficient for certain uses by the addition thereto of our present Invention. In the said Figures, A is the drying floor; B is the furnace for heating the floor; C is an auxilliary furnace; and D is an exhausting apparatus. The said drying

floor is formed of plates and is heated by the furnace B, and the matters to be dried are moved to and fro by means of a reciprocating frame provided with scrapers and stirrers, as will be better understood when reference is made to the Specification of the aforesaid former Patent. The said drying floor is enclosed and covered in by means of side walls *a*, *a*, and of hinged and removable covers *b*, *b*, and the space so enclosed is in communication by means of a flue *c* with the inlet opening of the exhauster D. In the example an apparatus known as Baker's blower is represented as being employed; but we do not confine ourselves to any particular apparatus, and a fan, or a "Root's blower," or any other suitable exhausting or withdrawing apparatus may be used. The vapours or vapours and gases withdrawn from the said enclosed space by the action of the blower are propelled through the pipes *d* into the ash-pit of the auxilliary furnace C. This furnace is represented in vertical section in Fig. 1, and in Fig. 3 the furnace front is omitted in order that the interior of the furnace and ash-pit may be seen, the front removed being similar to that of the main furnace. In each case the furnace is supplied with fuel by means of a hopper *e*, from which the fuel is fed by means of a revolving feeder *f*, which receives motion from a shaft *g* through spur gearing *h*. Each front is also fitted with a fire door *i* and an ash-pit door *k*, the said doors being arranged to fit as nearly air-tight as is conveniently possible.

In the example the fire-grate of each furnace consists of discs threaded upon shafts, in accordance with the aforesaid Patent granted to us in the year One thousand eight hundred and seventy-four. The said discs receive a revolving motion from the shaft *g*, upon which are formed cranks which actuate connecting rods *l*, which give motion to the disc roller by means of ratchets gearing with ratchet wheels fixed on the front disc roller in each furnace. The shaft *g* receives motion from a driving strap *m* through the worm and bevil gearing *n*, *n*, or by means of any other suitable arrangement of gearing. We do not however confine ourselves to this arrangement, as ordinary fire-bars and suitable arrangements for enclosing the ash-pits and furnaces may be employed in lieu of the arrangements represented. A flue O leads from the furnace C into the ash-pit of the furnace B.

When the apparatus is at work the blower D withdraws the vapours or gases and vapours from the enclosed space above the drying floor,

and propels them through the piping *d* into the ash-pit of the furnace C, whence they flow through the fire in the said furnace and through the flue O into the ash-pit of the main furnace B. The said vapours or the residue thereof then flow through the main furnace, and the residual gases or vapours and gases are conveyed away through the flues employed as means for heating the drying floor.

If found or considered to be desirable in any case air may be caused to mingle with the vapours before passing through either the first or the second fire. In some cases it may be desirable to pass the vapours into a condensing chamber or through chambers before the said vapours are admitted to the fire, and in some cases it may be of advantage to put water, or acid, or other liquid or substance in such chamber or chambers. The dotted lines *p* indicate such a chamber.

Although we have only shewn two furnaces acting in conjunction, in the example selected for illustration, we do not confine ourselves to this number. We may use a set of four furnaces arranged in two pairs, and provided with doors or dampers, so arranged as that the current of vapours can be divided and be conveyed into the ash-pits of the two first fires, and also that when required the whole of the vapours can be conveyed into either one of the said two ash-pits.

When it would be necessary to open the fire or ash-pit doors of a furnace in one of the pairs of furnaces the dampers would be arranged to direct the whole of the vapours through the other pair of furnaces. We have found it to be of importance to convey the vapours through more than one fire as one fire only has not sufficient effect.

Having now fully set forth and indicated the nature of our said Invention, and the manner in which we carry and may carry the same into practical effect, we would have it to be understood in conclusion that we claim,—

First. Forcing or conveying vapours, or vapours and gases, resulting as herein aforesaid successively through two or more fires.

Secondly. The method of, and arrangements for, decomposing or rendering less noxious vapours resulting from the treatment of matters herein indicated, substantantially as herein-before set forth and indicated.

Milburn & Jackson's Improvements in Decomposing Noxious Vapours.

And, Lastly. The arrangements, substantially as and for the purpose set forth and indicated herein-before and in the accompanying Drawings.

In witness whereof, we, the said Robert Milburn and Henry Jackson, have hereunto set our hands and seals, this Ninth day of June, in the year of our Lord One thousand eight hundred and seventy-six.

ROB^T. MILBURN. (L.S.)
HENRY JACKSON. (L.S.)

Witness,
W. C. RICHARDSON,
285, Queen's Road,
New Cross Gate,
S.E.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1876.

FIG. 1.

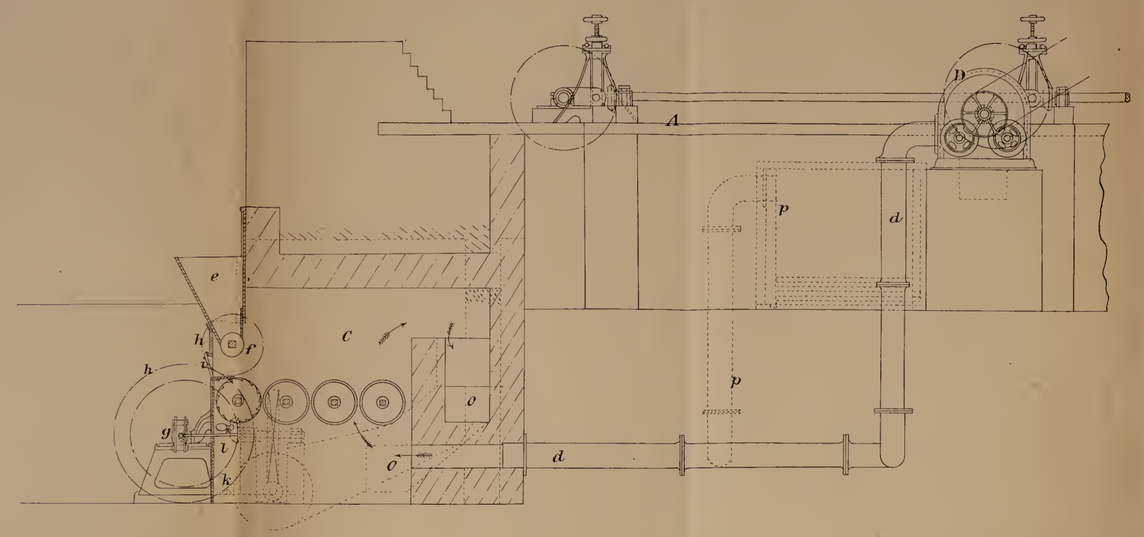


FIG. 2.

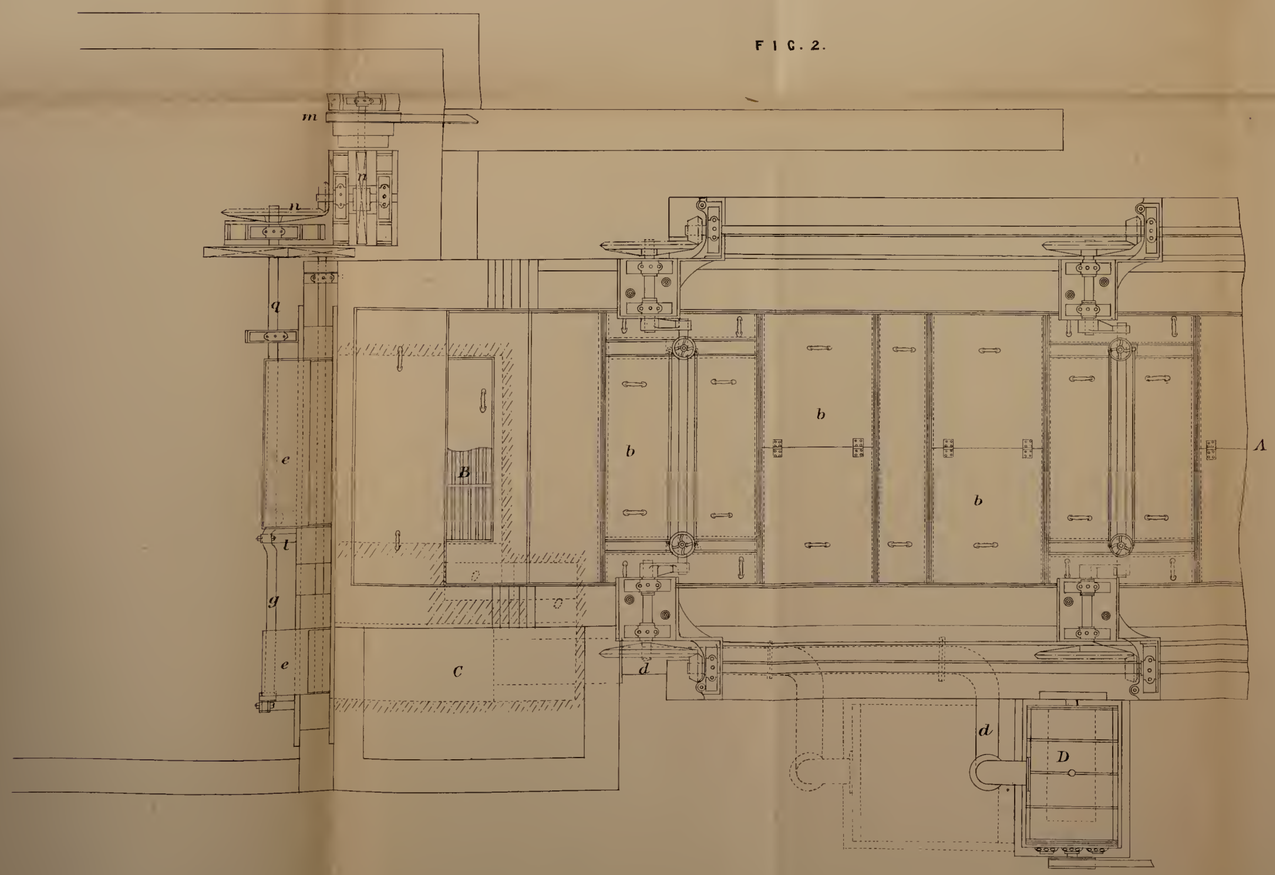
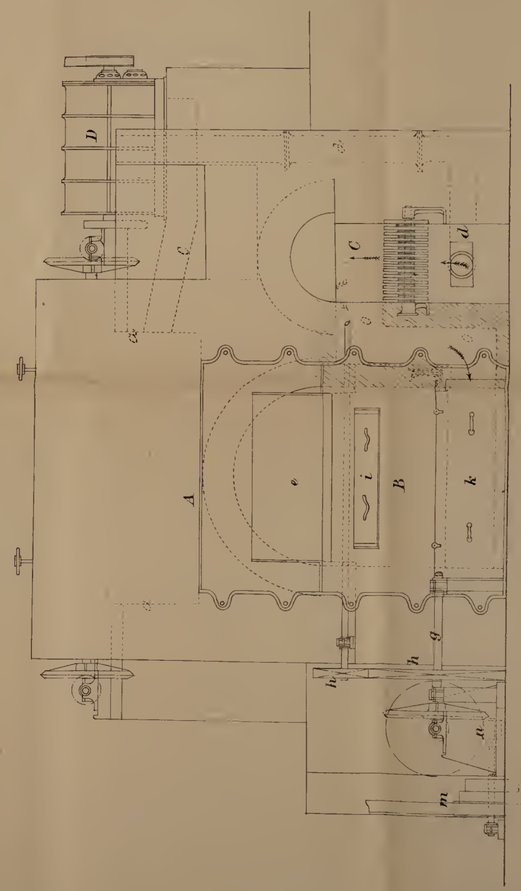


FIG. 3.



The filed drawing is partly colored.

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